

Refer to: HSA-10/WZ-100 Amendment #1

Mr. Bill Korman  
Korman Signs, Incorporated  
3029 Lincoln Avenue  
Richmond, Virginia 23228

Dear Mr. Korman:

This is in response to your letter of November 14, 2002, requesting Federal Highway Administration (FHWA) acceptance of a number of your company=s portable sign stands as crashworthy traffic control devices for use in work zones on the National Highway System (NHS). Accompanying your letter were reports of crash testing conducted by General Testing Services and video of the tests. You requested that we find these devices acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 “Recommended Procedures for the Safety Performance Evaluation of Highway Features.” As many of the stands are already covered under FHWA Acceptance Letter WZ-100, originally issued on June 20, 2002, you asked that we consider this a request to amend WZ-100 with the updated information.

### **Introduction**

The FHWA guidance on crash testing of work zone traffic control devices is contained in two memoranda. The first, dated July 25, 1997, titled “INFORMATION: Identifying Acceptable Highway Safety Features,” established four categories of work zone devices: Category I devices were those lightweight devices which could be self-certified by the vendor, Category II devices were other lightweight devices which needed individual crash testing, Category III devices were barriers and other fixed or massive devices also needing crash testing, and Category IV devices were trailer mounted lighted signs, arrow panels, etc. The second guidance memorandum was issued on August 28, 1998, and is titled AINFORMATION: Crash Tested Work Zone Traffic Control Devices.” This later memorandum lists devices that are acceptable under Categories I, II, and III.

A brief description of your requests, including designation of the sign stands and the sizes and substrates you wish to use follows:

### **Request Number 1:**

Stands: SS548 UCA, SS548UC  
Signs: 60x60 or smaller Diamond or Square  
48x60 or smaller Rectangle

Substrates: Alpolic 350 with a one or two piece fiberglass rib adapter fastened to the back of the sign a minimum of ½ of the sign height to allow mounting to a stand in the same fashion that a roll up sign is mounted.

Mounting Ht: 21 inches

Other: With or without flags or ballast

**Request Number 2:**

Stands: SS548UCRA, SS548UCR, SS560UCRA, SS560UCR

Signs: 60x60 or smaller Diamond or Square  
48x60 or smaller Rectangle

Substrates: Alpolic 350 with a one or two piece fiberglass rib adapter fastened to the back of the sign a minimum of ½ of the sign height to allow mounting to a stand in the same fashion that a roll up sign is mounted.

Other: With or without flags or ballast

Mounting Ht: 13 inches

**Request Number 3:**

Stands: SS548SSUC, SS548SSUCA

Signs: 60x60 or smaller Diamond or Square  
48x60 or smaller Rectangle

Substrate: Alpolic 350 with a one or two piece fiberglass rib adapter fastened to the back of the sign a minimum of ½ of the sign height to allow mounting to a stand in the same fashion that a roll up sign is mounted.

Other: With or without flags or ballast

Mounting Ht: 21 inches

Enclosure #1 is a summary of the acceptances that this request embraces, with an indication of the mounting height of each sign that was tested and is to be considered for acceptance.

**Testing**

Full-scale automobile testing was conducted on your company's devices. Two stand-alone examples of the devices were tested in tandem, one head-on and the next placed six meters downstream turned at 90 degrees, as called for in our guidance memoranda.

Enclosure #2 is a summary of the crash tests conducted to support the requests.

Enclosure #3 is another summary which relates the individual stands to the tests conducted as part of this submission, as well as to earlier FHWA letters of acceptance which support the individual request. Enclosure #4 is a summary of the product description and a glossary of terms used to describe the variations in your company's stands. Enclosure #5 contains a drawing of each stand, for reference.

The test run to verify performance of the practice of affixing a partial mast to the back of the Alpolic 350 substrate is summarized in the table below.

	Test Session # 20	
Test Number	100A (Head-on)	100B (90 degrees)
Sign Stand Tested	SS548UCA	S484DAPUC
Weight of Tested Stand	24 pounds	24 pounds
Mounting heights	21 inches	21 inches
Flags? Lights?	None	None
Mass of Test Vehicle	Approx 1800 pounds	
Impact Speed	Approx 58 mph	Approx 58 mph
Velocity Change	NR	NR
Extent of contact	Sign struck windshield	Sign struck windshield
Windshield Damage	Moderate cracking	Moderate cracking
Other notes	Concentrated cracking at point of impact	Concentrated cracking at point of impact, deflection no greater than ½ inch

### Findings

Damage was limited to moderate cracking of the windshield plus minor damage to the bumper, hood, and roof of the test vehicle. There were no instances of passenger compartment penetration or intrusion.

Requests 1 and 2 are for stands included in acceptance letters WZ-21, WZ-29, and WZ-100. This amendment adds the Alpolic 350 sign panel with a half-height fiberglass vertical rib attached to the back of the sign. This allows its use with these stands in the same manner as a roll-up sign. Request 3 is for a single-spring version of previously accepted stands.

The results of the testing met the FHWA requirements and, therefore, the devices described in the various requests above and detailed in the enclosed tables and drawings are acceptable for use on the NHS under the range of conditions tested, when proposed by a State.

Please note the following standard provisions that apply to FHWA letters of acceptance:

- ! Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- ! Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- ! Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.

- ! You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- ! You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of FHWA and NCHRP Report 350.
- ! To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-100 Amendment #1 shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- ! They may include patented components and if so are considered "proprietary." The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are selected by the contractor for use as needed and removed upon completion of the project. Under such conditions they can be presumed to meet requirement "a" given below for the use of proprietary products on Federal-aid projects. On the other hand, if proprietary devices are specified for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

Sincerely yours,

Harry Taylor,  
Acting Director, Office of Safety Design

Enclosure

FHWA:HSA-10:NArtimovich:tb:x61331:6/19/02  
File: WZ100-KormanFin.wpd  
cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;  
N. Artimovich, HSA-10)